

U.S. Antarctic Marine Living Resources Program

2012-2013 Weekly Field Reports

Cape Shirreff, Livingston Island

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Science Report

Seabirds

1. We conducted the annual gentoo chick census on 10 February, approximately one week after the peak crèche date. We counted 683 chicks, 9.3% lower than last year's count of 753 and 27.5% lower than the previous 16 year mean of 941. This year there was an average of .80 chicks per nest and is the lowest we have seen in the last 16 years.
2. All active chinstrap and gentoo penguin nests in the reproduction studies have crèched. The failure of the chinstrap penguin reproduction study has remained the same as last week at 36% and the remaining 64% are crèched. The failure of the gentoo penguin reproduction study has also remained the same as last week at 66% and the remaining 34% are crèched.
3. Of the 38 known-age gentoo penguin nests there are only two remaining nests that have not crèched. 29% have crèched, 66% have failed and 5% are brooding one chick. Of 59 known-aged chinstraps that initiated clutches all have crèched. The failure rate for known-aged chinstrap nests was 53% and the remaining 47% are crèched.
4. On 7 February we deployed five satellite transmitters and four Time Depth Recorders (TDRs) on gentoo penguins that have crèched chicks. The satellite transmitters will be used to determine where the penguins forage and the time-depth recorders give profiles of diving behavior. We will recover these instruments after one week of deployment.
5. We now have three macaroni penguins molting in our chinstrap colonies.
6. We continue to sample the diets of the penguins using the wet offloading technique. To date, we have collected samples from 35 chinstrap penguins and 20 gentoos. We record total mass of stomach contents, diet composition, and length and sex frequency of krill for each sample. 97.2% of the chinstrap diets have consisted entirely of Antarctic krill (*Euphausia superba*). Only one chinstrap diet sample had weighable fish, but it made up less than 1% of the sample. Otoliths from *Gymnoscopelus nicholsi*, *Electrona antarctica*, and an unknown species were found in 8.5% of the chinstrap diet samples but they contained no other evidence of fish. Of the 20 gentoo penguin diets, 15 have contained fish. Fish accounted for 31% of the total weight of gentoo penguin samples. The majority of the otoliths found in the last five gentoo samples were from *Trematomus newnesii* and from *Lepidonotothen kempfi*.



7. Of the 17 brown skua territories that are regularly monitored, seven of these pairs are still brooding one chick and 10 have failed.

Pinnipeds

8. Two more CCAMLR attendance study pups have died. That brings the total to 22 of the 30 study females that have lost their pup.
9. Sixteen pups of the twenty females that completed 6 trips to sea have been weighed according to protocol. This completes all 6th trip pup weights, as the other four pups were lost to leopard seal predation before a weight could be obtained. Mean mass gain from the start of female foraging cycles to completion of the sixth trip suckling bout was 86.9 g/d (s.d.=22.3).
10. Trip durations decreased slightly this week. Twenty of the thirty attendance study females completed at least six trips to sea before they lost their pup, nine completed at least nine, and two females have completed 12. The following are mean values for trip durations of all females with living pups by calendar week:

Week of:	Mean Trip Duration (days)	S.D.	N (completed trips by week)
12/2/2012	4.30	1.88	6
12/9/2012	3.98	2.11	26
12/16/2012	4.80	2.05	26
12/23/2012	4.02	1.13	31
12/30/2012	4.51	1.22	35
01/06/2013	5.02	1.65	24
01/13/2013	4.71	1.18	21
01/20/2013	4.99	1.00	16
01/27/2013	5.07	1.24	12
02/03/2013	3.19	1.43	6

11. We continue to monitor our adult tagged female population and mother pup pairs to get a measure of reproductive success and loss of pups due to leopard seal predation. Our current estimate for pup loss to leopard seal predation as of 10 February is 54.7%.

12. Systematic surveys of defined areas of the Cape for the 500 per annum fur seals tagged as pups continued this week. This will give us a measure of tags sighted per unit of effort for different cohorts and for different areas of the Cape.



13. This week we collected our eighth fur seal diet sample of ten scats. To date 80 scats have been collected, and 45 have been processed.
14. This week we recovered three TDRs from adult female fur seals, none of which have yet lost their pup. That brings the total recovered for the year to eleven. These records provide information about foraging and diving behavior. There is one remaining TDR deployed on an adult female. We also recovered one geolocation light sensor (GLS) tag from a juvenile fur seal. To date we have recovered five GLS tags from juveniles and 41 from adult females. These GLS tags were deployed overwinter and will provide information on their winter foraging locations.
15. We have flipper tagged 112 fur seal pups for future demographic studies and cohort success. Twelve of these were the pups of tagged adult females. Our remaining 288 tags for the year will be deployed over the next two weeks.
16. On February 8 we completed our twelfth weekly Cape-wide Phocid census. Note the sharp decrease in elephant seals as they complete their molt and return to sea. We counted 196 southern elephant seals, 39 Weddell seals, and 16 leopard seals.
17. As of 10 February we have recorded 278 sightings of 31 tagged leopard seals. We have recorded an additional 69 sightings of untagged or otherwise unidentified seals which have been added to our photo-identification database. Twenty of the thirty-one tagged seals returned from previous years and the other eleven we have tagged this year.
18. We completed two more leopard seal captures this week. To date five GPS location instruments have been recovered from leopard seals, and another deployed. These instruments together with stable isotope analysis of blood will help us understand leopard seal foraging behavior and quantify their impact on Antarctic fur seals and penguins. To date we have successfully performed twelve leopard seal captures on eight animals.
19. During the 2011-12 field season, 10 GLS tags were deployed on leopard seals in order to extend our understanding of over-winter leopard seal movements and breeding phenology. As of today, four GLS tags have been recovered.
20. Leopard seal CRITTERCAM deployments: In an effort to describe leopard seal foraging ecology, we have deployed four animal-borne video instruments (CRITTERCAM developed by National Geographic's Remote Imaging group) on adult female leopard seals. This week we recovered another instrument which brings our total deployments to four CRITTERCAM/GPS systems and recoveries to three.



21. This week was plagued by thick fog and rain, but we continued to operate the APH-22 hexacopter in order to study nutritive condition in leopard seals, establish aerial coverage of fur seal breeding beaches, and map/census penguin colonies. This week we surveyed one additional leopard seal, initiated coverage of fur seal beaches, continued our data analysis of images, and refined our technical knowledge of the hexacopter system.

Weather

22. This was a wet and foggy week with very little sunshine. Winds averaged 12.3 mph with a maximum wind speed of 38 mph. The predominant wind directions were west (80.2%) and south (14.3%). Precipitation for the week was 0.22 inches bringing the season total to 2.2 inches. The average temperature was 2.1° C with a high of 5.3° C and a low of 0.4° C. Mean daily solar radiation was 9,242 Wm². Sunrise is now at 5:10 AM (CLST) and sunset is at 9:12 PM (CLST).

Camp

23. Despite the inclement weather, we made significant improvements to camp this week and prepared for the upcoming seasonal camp closure. Highlights included 1) (finally) getting through the snow and ice on the boat landing beach to bring the last of the opening camp supplies to the hut 2) staging and organizing outgoing gear for transport back to La Jolla 3) Repairing all door covers and fitting them for closing 4) building and painting 3 new window covers 5) treating all fuel with preservative 6) inventorying and stowing skis/snowshoes and 7) Continuing to dry, pack and stow gear from opening.
24. Our large capacity fan was brought in to dry out a persistently damp area along the south wall of the main camp with moderate success.
25. With all of the rain, our water stores are now at 100% capacity.



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